Fig S1 Plots for Individuals elements: Plotted as marine fish (left of first dotted line), freshwater high plated fish (between the two dotted lines), and freshwater low plated fish (right of the dotted lines). Shapes correspond to rearing environment (circles are wild caught, triangles are lab raised in freshwater, squares are lab raised in saltwater). Plotted as means +/- SEM.
Fig. S2: Ca uptake rate (nmol g^-1 h^-1) for each stickleback population including marine populations (on left), high plated freshwater population (center), and low plated freshwater populations (on right). All individuals were wild caught and acclimated to the lab for >2 weeks. Plotted as means +/- SEM.
**Fig S3:** PC of elemental variation illustrating the differences in composition between wild-caught freshwater stickleback populations from nearby and similar lakes that differ in plate phenotype for all elements. The five main elements that load on PC1, which largely distinguishes individuals with different plate morphs, are P, Cr, Sr, Ca, and Mg.
**Fig. S4: Fig 1:** PC plots showing the differences in the ionome between individuals across stickeback ecotypes with the loading of each element indicated separately for: A) lab reared stickeback with high and low plate phenotypes (Fig. 1A), B) wild-caught marine (2 populations) and freshwater stickeback populations (5 populations) (Fig. 2A) C) marine and freshwater stickeback lab-reared in salt water (Fig. 2B) D) marine and freshwater stickeback reared in fresh water (Fig. 2C).
**B**

Wild Marine–Freshwater All elements

PC1 (34.4% explained var.)

PC2 (25.4% explained var.)

Population
- Freshwater
- Marine

- Kennedy
- Klein
- Muddy
- North
- Oyster
- Ruby
- Trout

**C**

Lab Marine–Freshwater–reared saltwater

PC1 (62.7% explained var.)

PC2 (14.6% explained var.)

Population
- Marine
- Freshwater

- Marine
- Freshwater
Lab Marine–Freshwater–reared freshwater

Population
- Marine
- Freshwater

factor(Marine)
- Marine
- Freshwater

PC1 (50.3% explained var.)

PC2 (18.3% explained var.)

-2.5 0 5

-2.5 0 5
Fig. S5: The relationship between fish mass and P assimilation for a marine and freshwater stickleback population